the same number of turns as the three-dimentioned spiral which guides the white spot on the arm of the instrument. The chart is attached to the shelf E and can be pressed at will against the pencil point when passing over a scotoma.

The perimeter may be obtained of Meyrowitz Bros., New York; price $50.

LENS SERIES FOR THE REFRACTION OPHTHALMOSCOPE.

BY EDWARD JACKSON, M.D.,
PHILADELPHIA.

IN choosing the lens series for a refraction ophthalmoscope, we have to consider its completeness, and the convenience with which it may be used. To a certain extent these are inversely proportional; and in any series of much practical value, it is only possible to secure certain important advantages by sacrificing other advantages of less importance. Just how and where the sacrifice shall be made is largely a matter of individual taste; still that taste is to be exercised within certain limits. One of these limits is set by the minimum of inaccuracy in the correction that causes a perceptible blurring of the fundus image. This minimum may be placed at about 0.5 D., so that this is the smallest interval between the successive lenses of the series that conduces to certainty and exactness. To have the lenses varying by a smaller interval than this, rather favors inaccuracy and confusion. Again, with strong lenses, a slight difference in its distance from the observed eye makes a considerable difference in the degree of ametropia which the lens will correct. For a lens of over 6. D., one-half inch of difference in distance means more than 0.5 D. difference of power to correct ametropia. Hence, above 6. D., intervals so small as 0.5 D. are useless. For the same reason it is not desirable to have a 1. D. interval above 10. D.

A third limit is fixed by the degrees of ametropia likely to be met with. This will be at the uttermost, taking the extreme cases, for convex, 20. D., for concave, 50. D.; while lenses above 12. D. convex and 25. D. concave will be very rarely useful.

I should regard a series composed of the following lenses as one of ideal completeness:

Convex 0.5, 1., 1.5, 2., 2.5, 3., 3.5, 4., 4.5, 5., 5.5, 6., 7., 8., 9., 10., 12., 15., 20. D.

Concave 0.5, 1., 1.5, 2., 2.5, 3., 3.5, 4., 4.5, 5., 5.5, 6., 7., 8., 9., 10., 12., 15., 20., 30., 50. D.

In sacrificing completeness, to gain other advantages, it is to be remembered that the strongest convexes and concaves of the above series are of the least value; and next, the 4.5, 5.5 and 9. D., especially the 9. in the convex and the 4.5 and 5.5 in the concave. It is, throughout, much less important to have 0.5 D. intervals in the concave series, because in myopia we have other ways of determining exactly the degree; while for latent hypermetropia nothing can replace the refraction ophthalmoscope.

With regard to the convenience of a given series, it is to be remembered, that the weak convex lenses are most frequently used; and next, the weak concaves, and convexes of medium power. Then it is convenient to be able, without taking the instrument from the eye, and with a single movement of the finger, to substitute for each lens, either the next above it or the next below it in the series. This is, however, only to be obtained by having a separate lens for each power in the series, and mounting them all in a single disk or slide. But it is also convenient, in dealing with the higher degrees of ametropia, to go at once to the approximate correction, without being compelled to go over all the weaker lenses first. That is, to have a sort of coarse adjustment, by which about the proper glass may be arrived at quickly; while a more accurate result may be arrived at by the subsequent use of a sort of fine adjustment. And this is only attainable by some arrangement, for combining two or more lenses, mounted in different disks or slides. Combination also renders it possible to get a full series from a few lenses, giving us smaller and lighter instruments.

The special series to which I wish to call attention have been adapted to the form of ophthalmoscope which I described in our *Transactions* last year (p. 111); but they could be used equally well in other forms of instruments. They are as follows:

Five lenses in each slide or disk.

A. First slide + 1., 2., 3., 4., 5.; second — 0.5, 6., 12., 18. and + 6. This is the series mentioned last year.

B. First slide + 1., 2., 3., 4. and — 22.; second — 0.5, 5., 10. and + 5., 10. Giving, Convex 0.5, 1., 1.5, 2., 2.5, 3., 3.5, 4., 5., 6., 7., 8., 9., 10., 11., 12., 13., 14.; Concave 0.5, 1., 2., 3., 4., 5., 6., 7., 8., 9., 10., 12., 17., 22., 27., 32.

C. First slide + 0.5, 1., 2., 3. and — 18.; second — 0.5, 4., 8. and + 4., 8. Giving, Convex 0.5, 1., 1.5, 2, 2.5, 3., 4., 5., 6., 7., 8., 9., 10., 11.; Concave 0.5, 1., 2., 3., 4., 5., 6., 7., 8., 10., 14., 18., 22., 26.

D. First slide + 1., 2., 3., 4., 13.; second — 0.5, 3., 6., 8., 23. Giving, Convex 0.5, 1., 1.5, 2., 2.5, 3., 3.5, 4., 5., 7., 10., 13.; Concave 0.5, 1., 2., 3., 4., 5., 6., 7., 8., 10., 19., 23.

Six lenses in each slide or disk.

H. First + 1., 2., 3., 4., 5., 6.; second — 0.5, 6.5, 7., 14., 21. and + 7. Convex 0.5, 1., 1.5, 2., 2.5, 3., 3.5, 4., 4.5, 5., 5.5, 6., 7., 8., 9., 10., 11., 12., 13.; Concave 0.5, 1., 1.5, 2., 2.5, 3., 3.5, 4., 4.5, 5., 5.5, 6., 6.5, 7., 8., 9., 10., 11., 12., 13., 14., 15., 16., 17., 18., 19., 20., 21.

I. First + 1., 2., 3., 4., 5. and — 27.; second — 0.5, 3.5, 6., 12. and + 6., 12. Convex 0.5, 1., 1.5, 2., 2.5, 3., 3 5, 4., 4.5, 5., 6., 7., 8., 9., 10., 11., 12., 13., 14., 15., 16., 17.; Concave 0.5, 1., 1.5, 2., 2.5, 3., 3.5, 4., 5., 6., 7., 8., 9., 10., 11., 12., 15., 21., 27., 33., 39.

J. First + 1., 2., 3., 4., 5., 17.; second — 0.5, 3.5, 6., 9., 11., 31. Convex 0.5, 1., 1.5, 2., 2.5, 3., 3.5, 4., 4.5, 5., 6., 8., 11., 14.5, 17.; Concave 0.5, 1., 1.5, 2., 2.5, 3., 3.5, 4., 5., 6., 7., 8., 9., 10., 11., 14., 26., 31.

K. First + 0.5, 1., 2., 3., 4., 14.; second — 0.5, 2., 5., 7., 9., 26. Convex 0.5, 1., 1.5, 2., 2.5, 3., 3.5, 4., 5., 7., 9., 12., 14.; Concave 0.5, 1., 1.5, 2., 2.5, 3., 3.5, 4., 5., 6., 7., 8., 9., 12., 22., 26.

L. First + 0.5, 1., 2., 3., 7., 11.; second — 0.5, 1., 2., 3., 7., 20. Convex 0.5, 1., 1.5, 2., 2.5, 3., 4., 5., 6., 7., 8., 9., 10., 11.; Concave 0.5, 1., 1.5, 2., 2.5, 3., 4., 5., 6., 7., 9., 13., 17., 20.

Of the above series, D and J, and within a more limited range L, are particularly notable for the convenience with which they may be used.

ALBUMINURIA OF PREGNANCY. RETINITIS. INDUCED PREMATURE DELIVERY.

BY S. D. RISLEY, M.D.,
PHILADELPHIA.

MRS. ———, aged thirty-five, consulted me in September, 1884, because of rapidly failing vision. She was pallid and very feeble, having quitted her bed in order to make the visit to the city. She was brought by her husband, a capable physician of large experience, who related that she was pregnant between the fourth and fifth months; that she had from the first suffered very much from morning sickness, and later from violent morning headache, with which she awoke. The pain was chiefly frontal, and subsided toward midday. Its duration steadily increased, however, until it became quite constant and more and more severe, at last confining her to her room and much of the time to her bed.

Within the preceding week these symptoms, especially the headache, had very much ameliorated, but with the diminished pain began the failing vision, which rapidly progressed, until in O. D., V. = counts fingers at two feet, eccentric fixation. O. S., V. = $\frac{1}{200}$. The ophthalmoscope revealed the usual appearances of pronounced albuminuric retinitis.

In O. D. macula = Em., while the most prominent part of the nerve = + 3.5 D. There was marked infiltration of the retina, giving a snow-bank appearance around the nerve and extending far into the periphery of the eye-ground. The nerve margins, and in many places the retinal vessels, were quite